

**Claims**

1. A method for treating a subject having, or at risk of developing, a cancer, comprising:

5 administering to a subject in need of such treatment a poly-G nucleic acid and a cancer medicament in an effective amount to treat the cancer or to reduce the risk of developing the cancer,

wherein the poly-G nucleic acid is not conjugated to the cancer medicament.

10 2. The method of claim 1, wherein the cancer medicament is selected from the group consisting of a chemotherapeutic agent, an immunotherapeutic agent, and a cancer vaccine.

15 3. The method of claim 2, wherein the chemotherapeutic agent is selected from the group consisting of methotrexate, vincristine, adriamycin, cisplatin, non-sugar containing chloroethylnitrosoureas, 5-fluorouracil, mitomycin C, bleomycin, doxorubicin, dacarbazine, taxol, fragylane, Meglamine GLA, valrubicin, carmustaine and poliferposan, MMI270, BAY 20 PKC412, LY231514, LY264618/Lometexol, Glamolec, CI-994, TNP-470, Hycamtin/Topotecan, PKC412, Valspodar/PSC833, Novantrone/Mitroxantrone, Metaret/Suramin, Batimastat, E7070, BCH-4556, CS-682, 9-AC, AG3340, AG3433, Incel/VX-710, VX-853, ZD0101, ISI641, ODN 698, TA 2516/Marmistat, BB2516/Marmistat, CDP 845, D2163, PD183805, DX8951f, Lemonal DP 2202, FK 317, Picibanil/OK-432, AD 32/Valrubicin, 25 Metastron/strontium derivative, Temodal/Temozolomide, Evacet/liposomal doxorubicin, Yewtaxan/Paclitaxel, Taxol/Paclitaxel, Xeload/Capecitabine, Furtulon/Doxifluridine, Cyclopax/oral paclitaxel, Oral Taxoid, SPU-077/Cisplatin, HMR 1275/Flavopiridol, CP-358 (774)/EGFR, CP-609 (754)/RAS oncogene inhibitor, BMS-182751/oral platinum, UFT(Tegafur/Uracil), Ergamisol/Levamisole, Eniluracil/776C85/5FU enhancer, Campto/Levamisole, Camptosar/Irinotecan, Tumodex/Ralitrexed, Leustatin/Cladribine, 30 Paxex/Paclitaxel, Doxil/liposomal doxorubicin, Caelyx/liposomal doxorubicin, Fludara/Fludarabine, Phamarubicin/Epirubicin, DepoCyt, ZD1839, LU 79553/Bis-Naphtalimide, LU 103793/Dolastain, Caetyx/liposomal doxorubicin, Gemzar/Gemcitabine, ZD 0473/Anormed, YM 116, Iodine seeds, CDK4 and CDK2 inhibitors, PARP inhibitors,

D4809/Dexifosamide, Ifes/Mesnex/Ifosamide, Vumon/Teniposide, Paraplatin/Carboplatin, Plantinol/cisplatin, Vepeside/Etoposide, ZD 9331, Taxotere/Docetaxel, prodrug of guanine arabinoside, Taxane Analog, nitrosoureas, alkylating agents such as melphelan and cyclophosphamide, Aminoglutethimide, Asparaginase, Busulfan, Carboplatin, Chlorombucil, 5 Cytarabine HCl, Dactinomycin, Daunorubicin HCl, Estramustine phosphate sodium, Etoposide (VP16-213), Floxuridine, Fluorouracil (5-FU), Flutamide, Hydroxyurea (hydroxycarbamide), Ifosfamide, Interferon Alfa-2a, Alfa-2b, Leuprolide acetate (LHRH-releasing factor analogue), Lomustine (CCNU), Mechlorethamine HCl (nitrogen mustard), Mercaptopurine, Mesna, Mitotane (o.p'-DDD), Mitoxantrone HCl, Octreotide, Plicamycin, 10 Procarbazine HCl, Streptozocin, Tamoxifen citrate, Thioguanine, Thiotepa, Vinblastine sulfate, Amsacrine (m-AMSA), Azacitidine, Erthropoietin, Hexamethylmelamine (HMM), Interleukin 2, Mitoguanzone (methyl-GAG; methyl glyoxal bis-guanyldrazone; MGBG), Pentostatin (2'-deoxycofomycin), Semustine (methyl-CCNU), Teniposide (VM-26) and Vindesine sulfate.

4. The method of claim 2, wherein the immunotherapeutic agent is selected from the group consisting of Ributaxin, Herceptin, Quadramet, Panorex, IDEC-Y2B8, BEC2, C225, Oncolym, SMART M195, ATRAGEN, Ovarex, Bexxar, LDP-03, ior t6, MDX-210, MDX-11, MDX-22, OV103, 3622W94, anti-VEGF, Zenapax, MDX-220, MDX-447, 20 MELIMMUNE-2, MELIMMUNE-1, CEACIDE, Pretarget, NovoMab-G2, TNT, Gliomab-H, GNI-250, EMD-72000, LymphoCide, CMA 676, Monopharm-C, 4B5, ior egf.r3, ior c5, BABS, anti-FLK-2, MDX-260, ANA Ab, SMART ID10 Ab, SMART ABL 364 Ab and ImmuRAIT-CEA.

5. The method of claim 2, wherein the cancer vaccine is selected from the group consisting of EGF, Anti-idiotypic cancer vaccines, Gp75 antigen, GMK melanoma vaccine, 25 MGv ganglioside conjugate vaccine, Her2/neu, Ovarex, M-Vax, O-Vax, L-Vax, STn-KHL theratope, BLP25 (MUC-1), liposomal idiotypic vaccine, Melacine, peptide antigen vaccines, toxin/antigen vaccines, MVA-based vaccine, PACIS, BCG vaccine, TA-HPV, TA-CIN, DISC- 30 virus and ImmuCyst/TheraCys.

6. The method of claim 1, wherein the cancer medicament is a hormone therapy.

7. The method of claim 1, wherein the cancer medicament is taxol.

8. The method of claim 1, further comprising administering interferon- $\alpha$  to the subject.

9. The method of claim 1, wherein the cancer is selected from the group consisting of bone cancer, brain and CNS cancer, connective tissue cancer, esophageal cancer, eye cancer, Hodgkin's lymphoma, larynx cancer, oral cavity cancer, skin cancer, and testicular cancer.

10. The method of claim 1, wherein the immunostimulatory nucleic acid has a modified backbone.

11. The method of claim 10, wherein the modified backbone is a phosphorothioate modified backbone.

12. A method for treating a subject having or at risk of developing a cancer, comprising:

administering to a subject in need of such treatment, an immunostimulatory nucleic acid having a modified backbone and a cancer medicament selected from the group consisting of an immunotherapeutic agent, a cancer vaccine and a hormone therapy,

wherein the immunostimulatory nucleic acid is free of a CpG motif, and a T-rich motif.

13. The method of claim 12, wherein the immunostimulatory nucleic acid is a poly-G nucleic acid.

14. The method of claim 13, wherein the poly-G nucleic acid is not conjugated to the cancer medicament.

15. The method of claim 12, wherein the cancer medicament is taxol.

16. The method of claim 12, further comprising administering interferon- $\alpha$  to the subject.

17. The method of claim 12, further comprising administering a cancer antigen to  
5 the subject.

18. The method of claim 17, wherein the cancer antigen is not conjugated to the immunostimulatory nucleic acid.

10 19. The method of claim 12, wherein the immunostimulatory nucleic acid has a nucleotide sequence selected from the group consisting of SEQ ID NO:134 through to SEQ. ID NO:146.

20 20. The method of claim F3, wherein the modified backbone is a phosphorothioate modified backbone.

21. A method for preventing an allergic reaction in a subject receiving a blood  
transfusion, comprising  
administering to a subject receiving a blood transfusion an immunostimulatory  
20 nucleic acid in an effective amount to prevent an allergic reaction to the blood transfusion.

22. The method of claim 21, wherein the blood transfusion is a red blood cell transfusion.

23. The method of claim 21, wherein the blood transfusion is a platelet transfusion.

24. The method of claim 21, wherein the immunostimulatory nucleic acid is a CpG nucleic acid.

25. The method of claim 21, wherein the immunostimulatory nucleic acid has a modified backbone.

26. The method of claim 25, wherein the modified backbone is a phosphorothioate modified backbone.

27. The method of claim 26, wherein the immunostimulatory nucleic acid with the phosphorothioate modified backbone is free of a CpG motif, and a T-rich motif.

28. The method of claim 21, wherein the immunostimulatory nucleic acid is not a poly-G nucleic acid.

29. The method of claim 21, wherein the subject has cancer.

30. The method of claim 21, wherein the subject is anemic or thrombocytopenic.

31. A method for treating a subject having or at risk of developing cancer, comprising

administering to a subject in need of such treatment an immunostimulatory nucleic acid selected from the group consisting of a CpG nucleic acid and a non-CpG nucleic acid, and a cancer medicament that is a hormone therapy.

32. The method of claim 31, further comprising administering a cancer antigen to the subject.

33. The method of claim 31, wherein the hormone therapy is selected from the group consisting of estrogen therapy, anti-estrogen therapy, progestin therapy, androgen blockade, adrenocorticosteroid therapy, synthetic glucocorticoid therapy, androgen therapy, synthetic testosterone analog therapy, aromatase inhibitor therapy, gonadotropin-releasing hormone agonists therapy, somatostatin analog therapy.

34. The method of claim 31, wherein the immunostimulatory nucleic acid has a modified backbone.

35. The method of claim 34, wherein the modified backbone is a phosphorothioate modified backbone.

36. A device for delivering an immunostimulatory nucleic acid to a subject receiving an intravenous injection, comprising

an intravenous device selected from the group consisting of an intravenous bag  
5 and an intravenous tube, and an immunostimulatory nucleic acid,

wherein the immunostimulatory nucleic acid is coated on an internal surface of the intravenous device or is embedded within the intravenous device.

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